Analysis of Consumer Perception and Preference of Pasteurized Milk on Buying Decision during the COVID-19 Pandemic

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ABSTRACT

This study was carried out to determine consumer perceptions and preferences of pasteurized milk products with the Susu Nasional brand sold daily by mobile vendors. The influence of these perceptions and preferences on buying decision for Susu Nasional products was directed at the development of a contingency plan for companies during the COVID-19 pandemic. Data were collected through the use of questionnaires and purposive sampling from 20 indicators consisting of 13 exogenous and seven endogenous indicators. The collected data were analyzed using a descriptive statistical method with a partial least square structural equation modeling (PLS-SEM). The results showed a decrease in the buying decision of Susu Nasional products with an increase in the mobile selling implemented by the company due to the vendors' hospitality, comfort, availability of the product, and the close distance between mobile vendors and customers. On the other hand, the use of attributes by mobile vendors still needs to be increased during the pandemic through the addition of a point of sale by setting up a booth for consumer. In conclusion, PLS-SEM analysis showed that consumer perceptions and preferences positively and significantly influenced 60% of the decision to buy Susu Nasional during the pandemic.

Keywords: Buying decision; contingency plan; perception; preference

INTRODUCTION

The COVID-19, which was declared a global pandemic on March 11, 2020, has had a significant impact not only on the health sector but also on the economy, society, education, and tourism. Government policies, such as social distancing, crowd avoidance, handwashing, staying at home, as well as engaging in remote schooling and work, directly changed the economic life of the community. This was particularly noticeable in businesses reliant on direct consumer interaction, as experienced by several enterprises accustomed to selling their products. A similar situation was experienced by CV Cita Nasional, the producer of Susu Nasional brand pasteurized milk sold by mobile vendors. Initially, the company was able to process approximately 4% of the total daily fresh milk production in Central Java.

The main products of CV Cita Nasional are pasteurized and homogenized milk, branded as Susu Nasional. In late 2020, interviews were conducted with three Susu Nasional mobile vendors in Yogyakarta. These interviews showed a steady decline in sales of Susu Nasional in Yogyakarta during the pandemic (from

March to December 2020), ranging between 30 to 50% compared to pre-pandemic sales.

Consumer buying decision are defined as responses in determining whether or not to make a specific purchase. These responses are determined by the of available product, which is associated with the behavior of prospective customer during the consumption activities associated with a product. The consumer buying behavior refers to the observable and measurable physical activities customers indulge in when purchasing a good or service (Peter & Olson, 2012). The buying decision of consumer depend on five stages, namely identification of needs, exploration of information, consideration of alternatives, the decision to buy, and subsequent attitudes and behavior showed by customers after making purchases.

Preference is defined as an inclination towards a choice that buyers or customers prefer. According to Schiffman & Wisenblit (2019), it is an influential component of consumer buying decision. Preferences reflect the pleasure or satisfaction consumer derive from several available product and service options. Its relevance lies in whether the product attributes are in line with the market segment targeted by the goods and services provider. The present study adopted two variables, namely exogenous and endogenous. Exogenous or influencing variables are consumer perceptions and preferences of Susu Nasional mobile vendors. Meanwhile, the endogenous or influenced variable used is the decision-making process in buying Susu Nasional products. In a previous study conducted by Lolowang (2019) on premium-type housing products, consumer preferences influence buying decision, and measured by social factors, payment methods, and environmental considerations.

According to preliminary studies, perception is a psychological factor in the consumer behavior model, which plays a significant role in influencing the buying decision-making process (Peter & Olson, 2012). The delivery process is one of several components of the place or distribution marketing mix. The close relationship between the place and the market is critical for the success of goods and service providers. Furthermore, the place factor also influences adopted strategies such as flexibility, competition, positioning, and focus. For example, place flexibility measures the extent to which providers of goods and services can respond to changing economic conditions (Peter & Olson, 2012).

In this study, exogenous variables include consumer perceptions and preferences related to the mobile sales of Susu Nasional products, while the endogenous variable is the buying decision process. Wardhani et al. (2016) stated that the perception variable influences consumer buying decision for green residential products. The perception variable is influenced by developer image, product attributes, and residential facilities.

The main aim of this study is to analyze consumer perceptions and preferences of Susu Nasional and its influence on buying decisions. The intended benefits include providing valuable insights to help companies in devising effective contingency plans, specifically in response to the challenges posed by the ongoing pandemic.

METHODS

This study was conducted in Yogyakarta using online questionnaires distributed between December 2020 and June 2021. The sample collection was examined using a purposive sampling non-probability method, considering specific criteria. The respondents were selected based on familiarity with the product, history of purchasing the products before and during the pandemic, and residence in Yogyakarta or Central Java.

The data collection process was carried out online using Google Forms, and the questionnaires were broadcasted through social media platforms such as Instagram, WhatsApp, and Twitter from April to May 2021. A total of 358 customer responses were obtained, with 66% from those residing in Yogyakarta and the remaining 34% living in Central Java. After successfully obtaining data from 358 customers, a preliminary step, including testing the normality of data distribution and eliminating outliers, was carried out before proceeding to the analysis of influence to ensure the final results were unbiased (Sungkawa, 2009). The analytical survey method was used in this study due to the quantitative nature of the data. Statistical media were then used to analyze the data, allowing for the identification of basic patterns or trends with respect to collected information (Yunus, 2010).

The Partial Least Square (PLS) method, categorized under the structural analysis model or Structural Equation Modeling (SEM), was used to test the theoretical relationships and confirm the associations between variables (Bashir et al., 2019). PLS is a powerful analytical method because it does not need to meet certain requirements such as sample size, measurement scale (ratio or interval scale), and data distribution. Additionally, the PLS indicators can categorized as either reflective or formative types (Nikmatus Sholiha & Salamah, 2015). The developed model is illustrated as Figure 1.

In PLS-SEM, an assessment of the measurement and structural models were conducted. The measurement
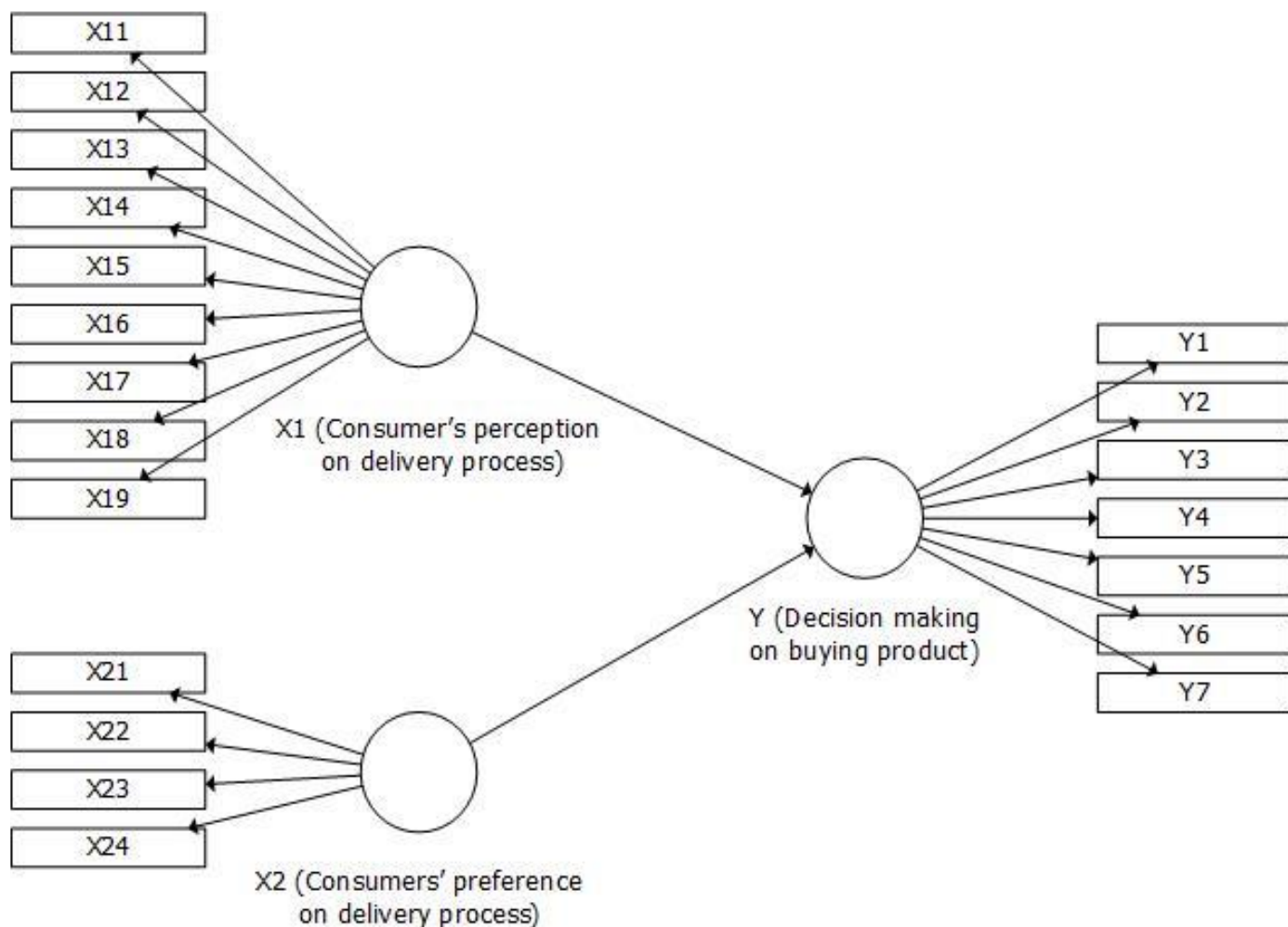
Figure 1. Study model for analyzing the influence of perceptions and preferences on the buying decision process of Susu Nasional consumer.

model, a part of the structural equation, shows the relationship between latent variables and specified indicators. Simultaneously, the structural model shows the connections between exogenous and endogenous latent variables through Equation 1.

$$\eta = B\eta + \Gamma\xi + \zeta \qquad (1)$$

Where: η (eta) = random vector of endogenous latent variables with mx1 size, ξ (xi) = random vector of exogenous latent variables with nx1 size, B = coefficient matrix of the endogenous latent variable with mxm size, Γ = coefficient of the exogenous latent variable, showing the relationship of ξ to η with mxn size, and ζ = random error vector with mx1 size.

Model Assessment

In PLS-SEM there are two evaluation which are of measurement model and structural model. The

measurement model (outer model) was analyzed by assessing the outer model. The evaluation of this model includes thorough assessments of validity and reliability (Hair et al., 2011). The assessments of validity include convergent validity (to assess loading factor value for each indicator should be greater than 0.7 and the AVE value greater than 0.5 is preferred), discriminant validity (to assess the square root of the AVE of a construct is mandated to be greater than others and cross loading should be greater than 0.7), reliability (the value of Cronbach's Alpha and composite reliability should be greater than 0.7)

The structural model (inner model) was analyzed to see the relationship between two variables. The assessment was done by testing the R-Square value for each variable to determine the variance explained by the constructs within the model, path coefficient to observe the direction of the correlation formed between constructs in the model, significance assessment was
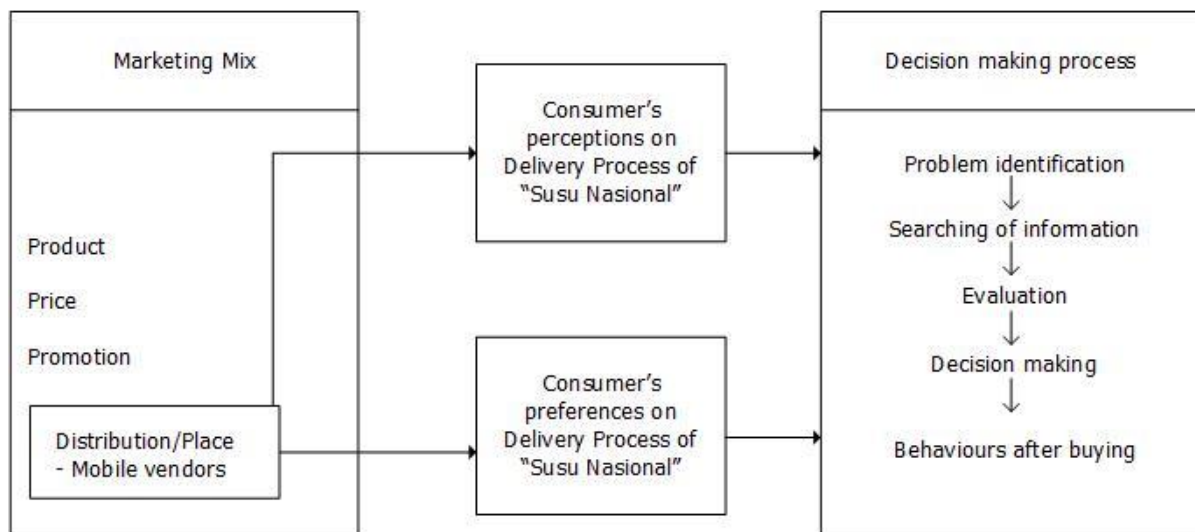
Figure 2. Framework

carried out by analyzing the t-statistic value using a bootstrapping procedure, Q-Square (Q^2) is used to determine the reliability of the observations, and the last assessment is model fit assessment was used to measure the effectiveness of the generated model.

To evaluate the fit of a PLS-SEM model, the SRMR (Standardized Root Mean Square Residual) and NFI (Normed Fit Index) values are considered. SRMR values of 0, <0.06, and 0.08 show a perfect, acceptable, and adequate fit, respectively (Henseler et al., 2016). Astiti et al. (2019) stated that NFI values range from 0 to 1, while > 0.90 and < 0.90 refer to perfect and good fit models, respectively.

The materials published by Kotler in 2002, was used to determine the variables for the buying decision-making process model. The initial step included transforming the model into a comprehensive framework, which is in accordance with the problem

Table 1. Operational definition of variables

Latent Variable	Indicator
Consumer perception of the current Susu Nasional mobile sales (ξ_1)	ξ_{11} = Marketing accuracy of Susu Nasional products using mobile vendors
	ξ_{12} = Mobile vendors & milk box hygiene
	ξ_{13} = Completeness of health protocols in mobile vendors
	ξ_{14} = Mobile vendors' hospitality
	ξ_{15} = Mobile vendors are easy to find
	ξ_{16} = Distance between mobile vendors and customer
	ξ_{17} = Convenience of buying products at mobile vendors
	ξ_{18} = Location selection by mobile vendors
	ξ_{19} = Product inventory
Consumer preferences regarding Susu Nasional mobile sales (ξ_2)	ξ_{21} = Susu Nasional products are sold by mobile vendors.
	ξ_{22} = Addition of health protocols to mobile vendors
	ξ_{23} = Susu Nasional products sold at booths at certain points in Yogyakarta
	ξ_{24} = Susu Nasional products sold online with Grab-Food or Go-Food apps.

Susu Nasional buying decision process (η_1)	η_{11} = Problem recognition
	η_{12} = Get product recommendations from relatives, family, and social media.
	η_{13} = Alternative evaluation
	η_{14} = Frequency of buying products before compared to during the pandemic decreased
	η_{15} = Desire to buy the product in the future
	η_{16} = Recommend products to friends & family
	η_{17} = Recommend products to social media

addressed in this study. The developed framework is shown in Figure 2.

The framework serves as the basis for establishing indicators to measure the proposed model's variables.

RESULTS AND DISCUSSION

Respondent Profile

Susu Nasional consumer from various social circles were distinguished based on the following demographics, gender, age, residence, latest education, occupation, average monthly income, product knowledge, and buying behavior. The study focused on respondents residing in the provinces of Yogyakarta and Central Java due to their cultural similarities and geographic proximity to these two regions. A total of 358 respondents were analyzed, and their characteristics are shown in Table 2. Removal of outlier data was carried out before proceeding to the effect analysis, which aims to avoid bias in the final results (Sungkawa, 2009). From the 358 data, 54%

Table2. Respondent profile

Characteristic	Category	N	Percentage
Gender	Male	144	40%
	Female	214	60%
	Total	358	100%
Age	10-15 years	21	6%
	16-20 years	186	52%
	21-25 years	137	38%
	26-30 years	10	3%
	>30 years	4	1%
	Total	358	100%
Domicile	DIY	236	66%
	Central Java	122	34%
	Total	358	100%
Latest education	Elementary School	5	1%
	Junior High School	76	21%
	Senior High School	219	61%
	Associate's Degree	10	3%
	Bachelor's Degree	48	14%
	Total	358	100%

Occupation	University Student	232	65%
	Student	76	23%
	Employee	14	6%
	Entrepreneur	6	2%
	Other	15	4%
	Total	358	100%
Income per month	<IDR 500.000	230	64%
	IDR 500.001-1.500.000	86	24%
	IDR 1.500.001-2.500.000	22	6%
	IDR 2.500.001-3.500.000	10	3%
	IDR >3.500.000	10	3%
	Total	358	100%

Table 3. Consumer perceptions of Susu Nasional mobile sales (vendors)

No	Aspect	Percentage of agree respond	Rank
4	Good hospitality	88%	1
7	Comfort is good	76%	2
9	Good product availability	75%	3
6	Close proximity	69%	4
2	Good cleanliness	67%	5
1	Mobile vendors	66%	5
3	Good proximity	58%	7
5	Easy to find	58%	8
8	Good location selection	41%	9

had the highest residual values and were assumed to be outliers due to the non-normality of its distribution (Limas et al., 2004). Therefore, 161 or 46% of the total data were further used for the effect stage analysis.

Consumer Perception of Susu Nasional Mobile Sales

The responses from each consumer in the questionnaire were grouped by summing the percentages of scores 1 and 2, labelled as disagree, 3 as neutral, while 4 and 5 combined and labelled as agree. Then, the total percentage of respondents who agreed with each aspect was calculated and ranked using the Likert scale.

According to Table 3, customers expressed a continued preference for purchasing Susu Nasional products through mobile vendors, citing reasons such as the hospitality experienced and the convenience associated with the buying process. Meanwhile, difficulties in product accessibility and limited location options are reasons for disliking buying Susu Nasional products from mobile vendors. The product accessibility was attributed to the dynamic nature of customers movements, making it challenging to find the desired products consistently.

Consumer Preferences Regarding Susu Nasional Mobile Sales

The consumer preference section of the questionnaire was also analyzed by calculating the total percentage of consumer agreeing with each aspect, resulting in the ranking shown in Table 4. However, the element that gained the highest agreement among consumer is the inclusion of health protocols for mobile vendors. This was influenced by the policies implemented by the government during the pandemic. The increase awareness of virus transmission risks through physical contact and the importance of sanitation, consumer expressed a significant preference for implementing health protocols by mobile vendors, particularly during these challenging times.

Susu Nasional Buying Decision Process

Consumer responses and their buying decision when purchasing Susu Nasional products are shown in Table 5. As can be seen in Table 5, 96% of consumer agreed that the problem associated with buying Susu Nasional products was influenced by low prices, perceived benefits, and the variety of available flavors. The majority agreed that purchasing decision were frequently guided by relatives, family, and social media recommendations. However, only some consumer stated

Table 4. Consumer preferences regarding Susu Nasional mobile vendors

No	Aspect	Percentage of positive respond	Rank
2	Addition of health protocols	89%	1
3	Sold at the stand	56%	2
1	Mobile vendors	49%	3
4	Delivery order	48%	4

Table 5. Susu Nasional buying decision process

No	Aspect	Percentage of positive respond	Rank
1	Problem recognition	96%	1
3	Receive external product recommendations	86%	2
2	Evaluation of alternatives	80%	3
7	Desire to buy the product in the future	80%	4
6	Decreased frequency of buying product	73%	5
4	Recommend products to social media	60%	6
5	Recommend product to relatives & families	58%	7

that after buying Susu Nasional products, they would voluntarily recommend the product to relatives and family directly or through social media. This suggested that the consumer buying experience may not strongly motivate them to take action or share their experience beyond the personal desire to repurchase the product.

Evaluation of Outer Model Measurements

The calculated results showed that the loading factor values for indicators X13, Y2 and Y4 are <0.7,

leading to the exclusion of these indicators. After recalculation, there are no loading factor that values less than 0.7. Therefore, it could proceed to the next evaluation stage, namely AVE assessment. Table 6 shows that the AVE values of the three variables are greater than 0.5. Therefore, it fits the rule of thumb requirements (Hair et al., 2011).

The reliability of this measurement model was evaluated by assessing both composite reliability and Cronbach alpha values. In accordance with the rule of thumb, the values of each construct must be greater than 0.7. The calculations performed proved that both composite reliability and Cronbach alpha values were > 0.7, hence the measurement model was reliable.

Evaluation of Inner Model Measurement

The evaluation of the inner model aims to determine the relationship and direction between latent constructs. It is crucial to state that each construct can only have one direction. Table 7 shows that the R-square value of 0. 6 can be expressed as a percentage by multiplying by 100% to obtain 60%. This means that all constructs or exogenous variables influenced the endogenous ones by 60%. In practical terms, consumer perceptions and preferences regarding the mobile sales of Susu Nasional explain 60% of the consumer buying decision process. This process starts with problem recognition, the emergence of a buying desire based on a reason, then getting input recommendations, evaluating existing alternatives, making purchases, planning repeated buying, and finally recommending the products to relatives through social media.

The exogenous and endogenous variables of consumer perception and preferences, specifically in the context of Susu Nasional mobile sales, positively impact product buying decision-making. This is because the path coefficient of the consumer perception and preference variables were 0.599 and 0.372, respectively.

The predictive relevance of the model is 0.115, showing that the observed and reconstructed values are consistent, while the exogenous variable constructs offer predictive relevance to the endogenous latent variable. Meanwhile, the SRMR and NFI values of 0.080

Table 6. AVE value, composite reliability, and Cronbach Alpha

Variable	Average Variance Extracted (AVE)	Composite Reliability	Cronbach's Alpha
X1 (Consumer perception)	0.572	0.914	0.893
X2 (Consumer preferences)	0.608	0.861	0.787
Y (Buying decision process)	0.596	0.881	0.831

Table 7. R-square

Variable	R-square
Y (Buying decision process)	0.600

and 0.793, showed that the model in this study is in the good fit category.

Based on the statistical description, the model had been properly constructed and was included in the good fit category. The purchasing decision for Susu Nasional products in this study was comprehensively explained by 60% of the factors discussed, particularly revolving around consumer perceptions and preferences regarding the use of mobile vendors as a marketing channel adopted by the providers of the goods. The present study reported the positive perceptions of consumer towards mobile vendors, particularly with respect to hospitality and convenience when making purchases. Producers need to maintain and prioritize their marketing methods through mobile vendors. The areas for potential improvement in product marketing methods include location choice and the ease of product accessibility. An interesting result is that incorporating health protocol attributes to mobile vendors during the pandemic gained the highest agreement from consumers. Therefore, this can be an input for producers to improve this aspect of their operation.

Contingency Plan

The contingency plan was influenced by insights from observing consumer perceptions and preferences regarding Susu Nasional mobile sales. Based on the data analysis conducted using SEM-PLS, it was established that consumer perceptions and preferences significantly and positively contributed to the decision-making process of buying Susu Nasional, explaining 60% of the variance. However, the remaining 40%, not elaborated in this study, focuses on aspects of the marketing mix other than distribution, namely product features, promotional strategies, and pricing. Additionally, external factors such as cultural aspects, social conditions, and the impact of the pandemic led to a reduction in consumer purchasing power, particularly for non-primary products.

The observations conducted showed that the choice of selling locations by mobile vendors, accessibility, and the completeness of health protocol attributes received less favourable responses compared to other aspects. Then, based on observations of Susu Nasional consumer preferences, these individuals tend to prefer the following options, namely continuing to use mobile vendors but strictly implementing and using health protocol attributes. Another option is to set up booths or stands at specific locations to enhance consumer accessibility. In examining the consumer decision process, it was evident that respondents generally tend not to recommend the products to others after making a purchase.

CONCLUSION

In conclusion, during the COVID-19 pandemic, consumer buying decision for Susu Nasional products decreased. Post-purchase actions were significantly limited, such as recommending products to relatives and family directly or through social media. However, the distribution of Susu Nasional products by mobile vendors had an insignificant influence on consumer perceptions because hospitality and convenience were the main reasons they preferred to make purchases through these individuals. Consumer preferences during the pandemic included a heightened demand for health protocol attributes to be implemented by mobile vendors. Additionally, there was an expressed need for Susu Nasional to establish booths selling products at specific points in an area. Consumer perceptions and preferences in this study only explain 60% of the decision-making process. Other influential factors, including environmental, social, and general decline in consumer buying decision during the pandemic, played significant roles.

CONFLICT OF INTEREST

The authors have no conflict of interests related to this publication.

REFERENCES

Astiti, N. P. N. S., Suamba, I. K., & Artini, N. W. P. (2019). Pengaruh Disiplin Kerja, Kepuasan Kerja dan Loyalitas Karyawan terhadap Kinerja Karyawan Agrowisata Bagus Agro Pelaga. *Jurnal Agrisocionomics*, *3*, 1–9.

Bashir, A. M., Bayat, A., Olutuase, S. O., & Abdul Latiff, Z. A. (2019). Factors affecting consumers' intention towards purchasing halal food in South Africa: a structural equation modelling. *Journal of Food Products Marketing*, *25*(1), 26–48. https://doi.org/10.1080/10454446.2018. 1452813

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing Theory and Practice*, *19*(2), 139–152. https://doi.org/10.2753/MTP1069-6679190202

Henseler, J., Hubona, G., & Ray, P. A. (2016). Using PLS path modeling in new technology research: Updated guidelines. *Industrial Management and Data Systems*, *116*(1), 2–20. https://doi.org/10.1108/IMDS-09-2015-0382

Limas, M. C., Meré, J. B. O., Ascacibar, F. J. M. D. P., & González, E. P. V. (2004). Outlier detection and data cleaning in multivariate non-normal samples: The PAELLA algorithm. *Data Mining and Knowledge Discovery*, *9*(2), 171–187. https://doi.org/10.1023/B:DAMI.0000031630.50685.7c

Lolowang, I. R. (2019). Pengaruh Persepsi dan Preferensi Konsumen terhadap Keputusan Pembelian Rumah Tipe Premium (Studi pada Konsumen Kawanua Emerald City Akrland Manado). *Ekonomi dan Bisnis*, *99*, 91–110.

Nikmatus Sholiha, E. U., & Salamah, M. (2015). Structural Equation Modeling-Partial Least Square untuk Pemodelan Derajat Kesehatan Kabupaten/Kota di Jawa Timur (Studi Kasus Data Indeks Pembangunan Kesehatan Masyarakat Jawa Timur 2013). *Jurnal Sains Dan Seni ITS*, *4*(2), 169–174.

Peter, P. J., & Olson, J. C. (2012). Consumer Behavior Marketing. In *Mc Graw*.

Rajamoorthy, Y., Radam, A., Taib, N. M., Rahim, K. A., Wagner, A. L., Mudatsir, M., Munusamy, S., & Harapan, H. (2018). The relationship between perceptions and self-paid hepatitis B vaccination: A structural equation modeling approach. *PLoS ONE*, *13*(12), 1–15. https://doi.org/10.1371/journal.pone.0208402

Schiffman, L. G., & Wisenblit, J. (2019). *Consumer Behavior*. New York: Pearson.

Sungkawa, I. (2009). Penditeksian Pencilan (Outlier) dan Residual pada Regresi Linier. *Informatika Pertanian*, *18*, 95–106.

Wardhani, W., Sumarwan, U., & Yuliati, L. N. (2016). Pengaruh Persepsi dan Preferensi Konsumen terhadap Keputusan Pembelian Hunian Green Product. *Jurnal Manajemen dan Organisasi*, *6*(1), 45. https://doi.org/10.29244/jmo.v6i1.12183

Yunus, H. S. (2010). *Metodologi Penelitian Wilayah Kontemporer*. Pustaka Pelajar.